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developing said first active energy setting material and said ink-repellent second active energy setting material so as to form said ejection port above said ink ejection pressure generating element.--

Concluded

REMARKS

This application has been reviewed in light of the final Office Action dated December 19, 2002. Claims 1-6 and 8 are presented for examination, Claim 7 having been withdrawn as directed to a non-elected invention. Claims 1, 2 and 4 have been amended to attend to formal matters, and Claim 1 has also been amended to define more clearly what Applicant regards as his invention. Claim 8 has been added. Claims 1 and 8 are in independent form. Favorable reconsideration is requested.

Claim 4 was objected to due to an informality. Claim 4 has been amended accordingly. The objection is believed to be obviated, and its withdrawal is therefore respectfully requested.

Claims 1, 2, 4 and 5 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,458,254 (*Miyagawa et al.* '254) in view of U.S. Patent No. 5,331,344 (*Miyagawa et al.* '344). Claims 3 and 6 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the same references and further in view of U.S. Patent No. 4,429,027 (*Chambers, Jr. et al.*), and U.S. Patent No. 4,536,468 (*Yasui et al.*), respectively. In response to these rejections, Applicants respectfully submit the following remarks.

One feature of the invention as set forth in independent Claim 1 is a step of exposing a first active energy setting material and an ink-repellent second active energy setting

material in a process by a second application of light to both of the materials through a second mask corresponding to an ejection port for ejecting ink. Independent Claim 8 recites a similar step.

Miyagawa et al. '254 relates to a method for manufacturing a liquid jet recording head. According to the method, an ink flow passage pattern 4 is formed on a substrate 1 by a dissolvable resin, a resin layer 5 is formed on pattern 4, a silicon oxide film 6 is formed on resin layer 5, and a resist is formed on film 6 (see, e.g., col. 9, line 50 - col. 12, line 40 and col. 15, lines 41ff). Ink discharging ports 7 are formed by oxygen plasma etching, using the resist as a mask (see, e.g., col. 11, line 40 - col. 12, line 8). The Examiner contends, *inter alia*, that the silicon oxide film 6 is "equivalent to the claimed 'ink -repellant second active energy setting material'." Without conceding the propriety of that contention, Applicants submit that, even assuming the silicon oxide film 6 corresponds to the claimed ink -repellant second active energy setting material, nothing in *Miyagawa et al. '254* would teach or suggest a step of exposing a first active energy setting material and an ink-repellent second active energy setting material in a process by an application of light to both of the materials through a mask corresponding to an ejection port for ejecting ink.

Miyagawa et al. '344 relates to a method for producing a liquid discharging recording head, a recording head produced thereby, and a recording apparatus utilizing the recording head. The method of *Miyagawa et al. '344* includes a step of forming a first photosensitive material layer for ink channel formation, pattern exposing the first layer, forming a second photosensitive material layer on the first layer, pattern exposing the second layer for forming an ink discharge opening and ink supply opening, and developing both layers. However,

Applicants can find nothing in *Miyagawa et al.* '344 that would suggest an ink-repellent second active energy setting material such as is recited in Claims 1 and 8. The Office Action cites *Miyagawa et al.* '344 as teaching "forming a liquid path pattern (photosensitive layer 3 in Fig. 2) on a base plate 1 with the use of a soluble resin (see col. 10, lines 52-58), by applying light through a mask 4 (see Fig. 3) and developing the liquid path pattern 3 afterward (see col. 12, lines 24-37)." Without conceding the propriety of the Examiner's contention, Applicants submit that nothing in *Miyagawa et al.* '344 would teach or suggest a step of exposing a first active energy setting material and an ink-repellent second active energy setting material in a process by an application of light to both of the materials through a mask corresponding to an ejection port for ejecting ink. Accordingly, *Miyagawa et al.* '344 is not seen to remedy the deficiencies of *Miyagawa et al.* '254 with respect to Claims 1 and 8.

According to Applicant's understanding, *Chambers, Jr. et al.* relates to a photoimaging process, whereby a nonvisible latent image is toned and the toner is transferred to a layer or cover sheet to form a radiation-opaque photomask. Even if, as alleged by the Office Action, *Chambers, Jr. et al.* be deemed to teach a flexographic printing method, this reference is not seen to remedy the deficiencies of *Miyagawa et al.* '254 with respect to Claims 1 and 8.

According to Applicant's understanding, *Yasui et al.* relates to a method of forming a resist pattern, wherein a pattern is printed on a substrate by a lithographic technique using a curable resist ink and the printed pattern is cured by irradiation and/or heating. Even if, as alleged by the Office Action, *Yasui et al.* be deemed to suggest that photoresists can comprise compositions of either silicon resins or epoxy resins, which are cationic polymerized compounds,

this reference is not seen to remedy the deficiencies of *Miyagawa et al.* '254 with respect to Claims 1 and 8.

A review of the other art of record has failed to reveal anything which, in Applicant's opinion, would remedy the deficiencies of the art discussed above, as references against the independent claims herein. Those claims are therefore believed patentable over the art of record.

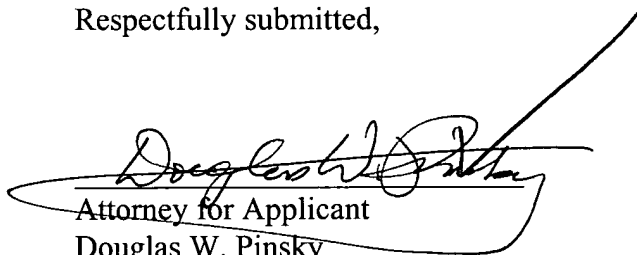
The other claims under consideration in this application are each dependent from independent Claim 1 and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

Applicant submits that this Amendment After Final Rejection clearly places the subject application in condition for allowance. This Amendment was not earlier presented, because Applicant believed that the prior Amendment placed the subject application in condition for allowance. Accordingly, entry of the instant Amendment as an earnest attempt to advance prosecution and reduce the number of issues, is requested under 37 C.F.R. § 1.116.

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and early passage to issue of the present application.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



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MAR 14 2003
TECHNOLOGY CENTER R3700

Application No.: 09/526,173
Attorney Dkt. No.: 01714.000029

APPENDIX

VERSION SHOWING CHANGES MADE TO CLAIMS

1. (Twice Amended) A method of manufacturing an ink-jet recording head comprising the steps of:

preparing a base plate having an ink ejection pressure generating element;

forming a liquid path pattern on said base plate with use of a soluble resin, by [applying] a first application of light through a first mask and developing afterward;

applying a first active energy setting material on said base plate and said liquid path pattern;

applying an ink-repellent second active energy setting material on said first active energy setting material;

exposing said first active energy setting material and said ink-repellent second active energy setting material in a process by a second application of light to both of said materials through a second mask corresponding to an ejection port for ejecting ink;

developing said first active energy setting material and said ink-repellent second active energy setting material so as to form [an] said ejection port above said ink ejection pressure generating element; and

removing said liquid path pattern,

wherein said ink-repellent second active energy setting material is applied through a drying process.

2. (Twice Amended) The method of manufacturing the ink-jet recording head according to claim 1, wherein said step of applying [an] said ink-repellent second active energy setting material on said first active energy setting material is performed by a method of spraying fine particles of said second material.

4. (Twice Amended) The method of manufacturing the ink-jet recording head according to claim 1, wherein said step of applying [an] said ink-repellent second active energy setting material on said first active energy setting material is performed by a method of transforming said second active setting energy material into a dry film and applying said film on said base plate.